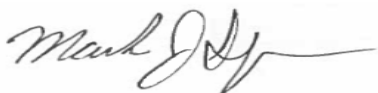


The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council (SAC).



Mark Spencer
Quality and Reliability Engineer

Lumileds

IESNA LM-80 Test Report

1. Description of LED light sources tested

LUXEON 5050 with nominal CCT of 3000K (L150-3080502400000).

2. Package Pictures



Figure 1. Picture of the LUXEON 5050.

3a. Projected L_{70} extrapolations per IESNA TM-21-11

$I_f = 200\text{mA}$	
$T_s = 105^\circ\text{C}$	68,763
$T_s = 85^\circ\text{C}$	92,180
$T_s = 55^\circ\text{C}$	124,709

3b. Reported L_{70} extrapolations per IESNA TM-21-11

$I_f = 200\text{mA}$	
$T_s = 105^\circ\text{C}$	68,763
$T_s = 85^\circ\text{C}$	> 72,000
$T_s = 55^\circ\text{C}$	> 72,000

4. Applicable LUXEON® Series part number(s)

This Test Report applies to the following LUXEON part numbers*:

Product Family	Part Number	Nominal CCT
LUXEON 5050	L150-2790500600000	2700K
LUXEON 5050	L150-2780500600000	2700K
LUXEON 5050	L150-2770500600000	2700K
LUXEON 5050	L150-2780502400000	2700K
LUXEON 5050	L150-2790502400000	2700K
LUXEON 5050	L150-3090500600000	3000K
LUXEON 5050	L150-3080500600000	3000K
LUXEON 5050	L150-3070500600000	3000K
LUXEON 5050	L150-3070502400000	3000K
LUXEON 5050	L150-3080502400000	3000K
LUXEON 5050	L150-3090502400000	3000K
LUXEON 5050	L150-3590500600000	3500K
LUXEON 5050	L150-3580500600000	3500K
LUXEON 5050	L150-4070500600000	4000K
LUXEON 5050	L150-4090500600000	4000K
LUXEON 5050	L150-4080500600000	4000K
LUXEON 5050	L150-4070502400000	4000K
LUXEON 5050	L150-4080502400000	4000K
LUXEON 5050	L150-4090502400000	4000K
LUXEON 5050	L150-5070500600000	5000K
LUXEON 5050	L150-5080500600000	5000K
LUXEON 5050	L150-5070502400000	5000K
LUXEON 5050	L150-5080502400000	5000K
LUXEON 5050	L150-5770500600000	5700K
LUXEON 5050	L150-5770502400000	5700K
LUXEON 5050	L150-6580500600000	6500K
LUXEON 5050	L150-6570500600000	6500K

Please note that all LUXEON 5050 6V (partnumbers L150-AABB500600000 where AA designates CCT and BB designates CRI) have a different equivalent current and voltage to the LUXEON 5050 24V part tested. An equivalent drive current I_f' for LUXEON 5050 6V parts can be determined as follows: $I_f' = I_f * 4$. The equivalent forward voltage would be quarter the voltage ($V_f/4$) of the LUXEON 5050 24V part tested.

5. Number of LED light sources tested

22 units per test.

6. Dates Tests Started

2015/20/04.

7. Date Report First Issued

2016/09/21.

8. Mechanical Drawing

For detailed mechanical drawings, please see the LUXEON 5050 datasheet.

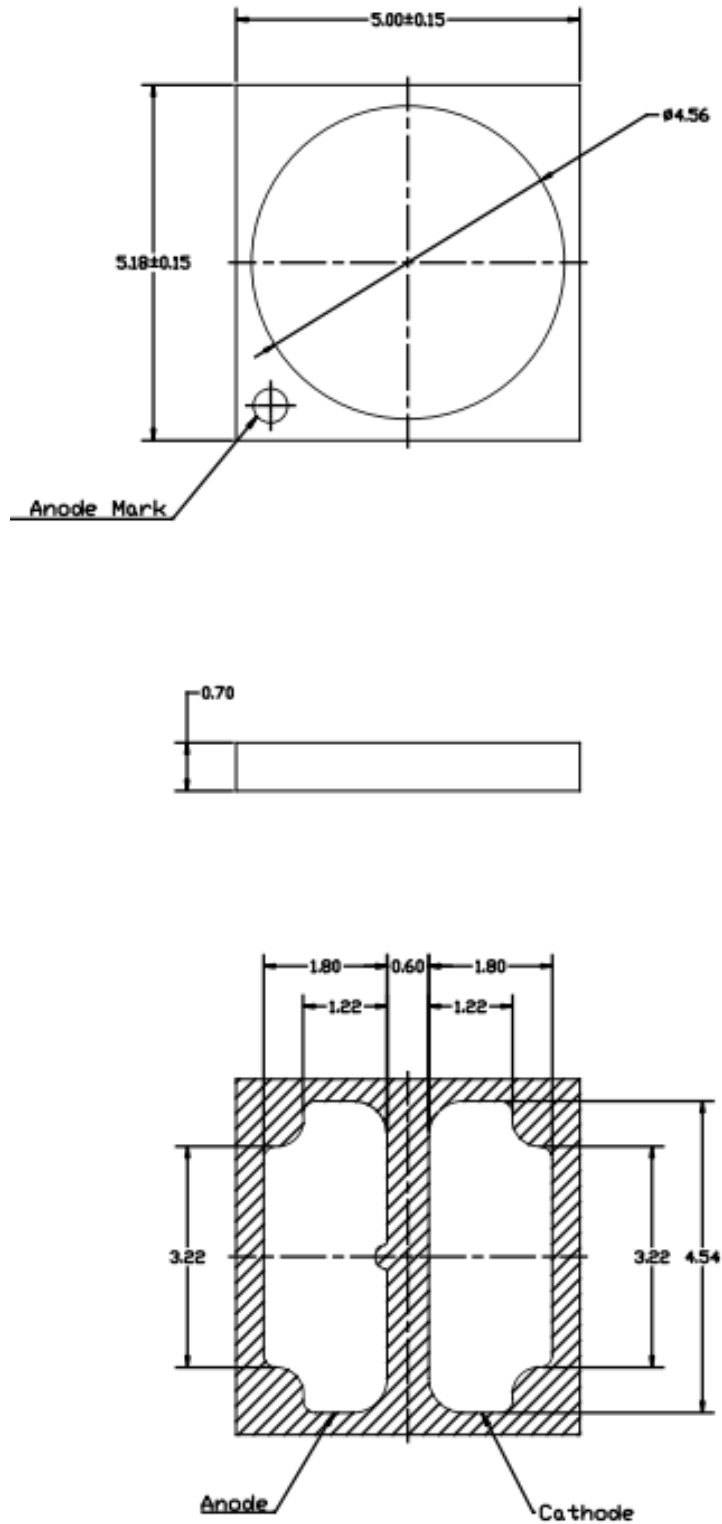


Figure 2. Mechanical drawings for the LUXEON 5050 (all dimensions in millimeters).

9. T_s Measurement Point

The circular pad in the bottom side of LUXEON 5050 corresponds to the recommended temperature measurement point T_s , see Figure 3.

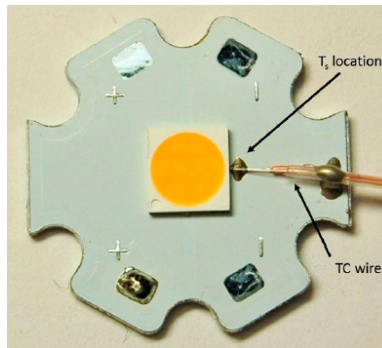


Figure 3. The recommended T_s point is seen above.

For further information on measuring the in-situ T_s , please see LUXEON 5050 Application Brief.

10. Description of auxiliary equipment

Reliability stress boards are mounted in a thermal chamber which provides liquid N₂ cooling and has a controlled air temperature.

11. Operating Cycle

LUXEON 5050 LEDs are driven with a constant direct current (DC).

12. Ambient conditions including airflow, temperature, and relative humidity

Case temperature (T_s): controlled to within -2°C

Surrounding air temperature: controlled to within -5°C of T_s

Humidity: < 65 RH, No forced air flow.

13. Case and ambient temperatures

See Section 3.

14. Drive current of the LED light source during lumen maintenance test

See tables.

15. Initial luminous flux and forward voltage at photometric measurement current

See tables.

16. Lumen maintenance for data for each individual light source along with median value, standard deviation, minimum and maximum lumen maintenance value for all of the light sources

See tables.

17. Observation of LED light source failures including the failure conditions and time of failure

No failures observed.

18. LED light source monitoring interval

Units were tested at 0 and every 1000 hours thereafter.

19. Photometric measurement uncertainty

Long-term measurement uncertainty is based on reproducibility tests done over a period of one year, calculated to $k = 2$ coverage (i.e. 95% coverage)

Uncertainty of light output is $U=1.59\%$. Uncertainty of correlated color temperature is $U=21K$.

20. Chromaticity shift reported over the measurement time

See tables.

21. Sampling Method/Sample size

LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days. These manufacturing lots are picked to represent a wide parametric distribution. Each Sample is soldered to all of the reliability stress boards for a given set of IESNA LM-80 tests.

LED sample size is indicated in Section 5 of this report.

22. ISO 17025-2005 Accreditation

Certificate for IESNA LM-80-08 with SAC-SINGLAS Certificate Number: LA-2016-0634-E.

Notes

Data is for reference only and is not an endorsement to exceed the datasheet operating conditions. The tests in this report were subcontracted to an external laboratory (RSZ170228502-10).

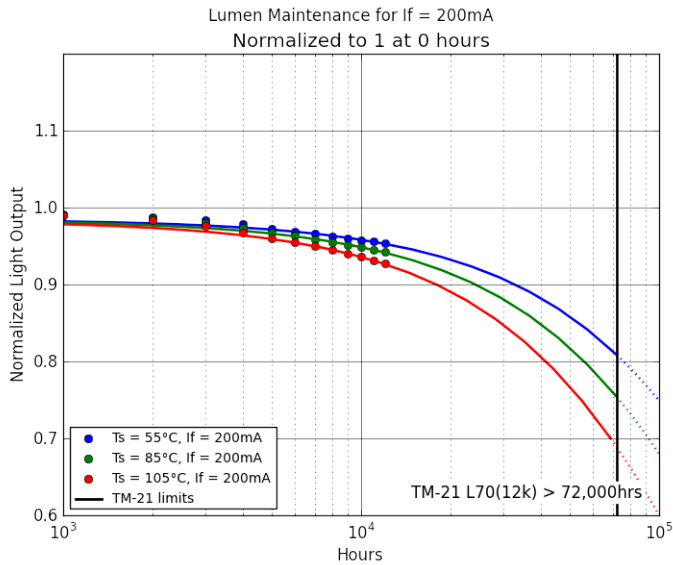
The TM-21 extrapolations are based on the IESNA TM-21-11 technical memorandum. The TM-21 lumen maintenance model is based on the flux data normalized to 1 at 0 hours and the use of an exponential model for flux (time):

Flux(time) = B exp[-alpha*time], where normally B ≅ 1, and alpha > 0.

An L70 extrapolation less than 0 means that the model predicts an increasing flux output with time, i.e. alpha < 0 (see graphs). Generally, this means that additional test time is needed to determine the long-term lumen maintenance behavior.

Normalized Flux Statistics for I_f = 200mA

	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	alpha	B	L70
median =	1.000	0.990	0.984	0.977	0.967	0.960	0.953	0.949	0.945	0.940	0.937	0.931	0.928			
Ts=Tair=105°C average =	1.000	0.990	0.983	0.976	0.967	0.960	0.955	0.950	0.945	0.940	0.936	0.931	0.927	4.9404e-06	0.9832	68,763
st dev =	0.000	0.002	0.003	0.003	0.004	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006			TM-21 L70(12k) = 68,763hrs
min =	1.000	0.985	0.976	0.968	0.959	0.949	0.945	0.940	0.934	0.931	0.927	0.921	0.917			
max =	1.000	0.994	0.987	0.982	0.974	0.972	0.968	0.965	0.959	0.952	0.949	0.943	0.939			
median =	1.000	0.989	0.985	0.981	0.974	0.967	0.964	0.960	0.957	0.954	0.951	0.947	0.944			
Ts=Tair=85°C average =	1.000	0.990	0.986	0.981	0.973	0.967	0.963	0.959	0.955	0.951	0.948	0.945	0.942	3.6972e-06	0.9843	92,180
st dev =	0.000	0.003	0.003	0.004	0.005	0.006	0.007	0.007	0.007	0.008	0.008	0.008	0.008			TM-21 L70(12k) > 72,000hrs
min =	1.000	0.986	0.979	0.973	0.965	0.957	0.951	0.947	0.943	0.939	0.936	0.933	0.930			
max =	1.000	0.998	0.993	0.992	0.985	0.980	0.976	0.971	0.967	0.964	0.961	0.959	0.957			
median =	1.000	0.992	0.988	0.984	0.978	0.972	0.969	0.966	0.964	0.960	0.958	0.956	0.954			
Ts=Tair=55°C average =	1.000	0.992	0.988	0.984	0.979	0.973	0.969	0.966	0.963	0.960	0.958	0.956	0.953	2.7367e-06	0.9847	124,709
st dev =	0.000	0.002	0.003	0.003	0.005	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.005			TM-21 L70(12k) > 72,000hrs
min =	1.000	0.988	0.982	0.978	0.968	0.963	0.961	0.957	0.954	0.950	0.949	0.946	0.943			
max =	1.000	0.998	0.993	0.991	0.988	0.981	0.977	0.976	0.972	0.968	0.967	0.965	0.964			



Lumileds IESNA LM-80 test report generated on Mon Jul 10 10:26:36 2017

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Delta u'v' for I_f = 200mA

	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
median =	0.0000	0.0007	0.0011	0.0015	0.0021	0.0023	0.0024	0.0024	0.0028	0.0034	0.0037	0.0040	0.0044
Ts=Tair=105°C average =	0.0000	0.0007	0.0011	0.0015	0.0020	0.0022	0.0024	0.0026	0.0029	0.0033	0.0037	0.0040	0.0043
st dev =	0.0000	0.0002	0.0001	0.0004	0.0008	0.0008	0.0009	0.0008	0.0007	0.0004	0.0004	0.0005	0.0005
min =	0.0000	0.0001	0.0009	0.0004	0.0005	0.0006	0.0011	0.0013	0.0021	0.0027	0.0030	0.0029	0.0035
max =	0.0000	0.0010	0.0013	0.0023	0.0035	0.0035	0.0046	0.0046	0.0047	0.0044	0.0044	0.0049	0.0051
median =	0.0000	0.0007	0.0012	0.0017	0.0019	0.0023	0.0024	0.0026	0.0029	0.0030	0.0033	0.0036	0.0040
Ts=Tair=85°C average =	0.0000	0.0008	0.0012	0.0017	0.0020	0.0022	0.0023	0.0026	0.0028	0.0031	0.0034	0.0037	0.0040
st dev =	0.0000	0.0003	0.0003	0.0003	0.0006	0.0008	0.0007	0.0008	0.0009	0.0006	0.0005	0.0005	0.0006
min =	0.0000	0.0002	0.0008	0.0014	0.0011	0.0004	0.0008	0.0010	0.0014	0.0017	0.0024	0.0027	0.0032
max =	0.0000	0.0018	0.0023	0.0026	0.0036	0.0042	0.0037	0.0041	0.0049	0.0047	0.0047	0.0052	0.0054
median =	0.0000	0.0007	0.0010	0.0012	0.0014	0.0017	0.0020	0.0022	0.0026	0.0030	0.0030	0.0033	0.0037
Ts=Tair=55°C average =	0.0000	0.0007	0.0010	0.0011	0.0015	0.0017	0.0020	0.0021	0.0025	0.0028	0.0030	0.0033	0.0036
st dev =	0.0000	0.0002	0.0003	0.0003	0.0005	0.0006	0.0005	0.0005	0.0005	0.0005	0.0003	0.0004	0.0004
min =	0.0000	0.0002	0.0003	0.0004	0.0006	0.0005	0.0011	0.0012	0.0013	0.0015	0.0024	0.0026	0.0027
max =	0.0000	0.0011	0.0016	0.0017	0.0022	0.0030	0.0029	0.0030	0.0033	0.0034	0.0036	0.0039	0.0043

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 55^{\circ}C$, $I_f = 200mA$; $T_s \geq 53^{\circ}C$ and $T_{air} \geq 50^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3082K	630.400	625.400	623.200	620.400	616.300	613.200	612.000	610.400	608.400	605.500	603.800	602.600	601.500
2	3057K	650.300	643.400	642.300	641.100	639.700	633.500	630.600	629.400	627.800	625.200	624.600	623.700	621.800
3	3088K	648.800	643.700	643.500	643.000	638.300	636.200	633.400	631.500	629.000	626.900	625.500	624.000	623.400
4	3094K	640.900	635.400	633.500	628.600	621.900	620.200	619.300	618.000	615.700	614.600	614.000	613.000	611.200
5	3082K	638.100	632.600	630.600	626.200	621.400	619.500	617.200	615.400	611.900	610.100	608.600	607.900	606.500
6	3098K	641.300	636.200	635.300	630.700	628.300	622.000	619.200	616.200	613.900	610.900	608.900	607.900	605.700
7	3081K	636.700	629.900	627.200	625.900	621.900	618.800	616.300	613.100	610.600	609.000	607.300	605.900	604.400
8	3075K	645.800	640.900	638.300	636.600	632.000	629.700	628.900	626.700	625.000	621.900	620.400	617.600	616.900
9	3123K	644.800	640.900	639.100	636.500	635.800	631.800	629.600	625.600	623.600	622.400	620.300	618.200	616.600
10	3094K	635.300	627.500	627.200	624.100	621.000	615.900	614.700	613.000	611.700	609.400	608.300	606.200	604.600
11	3100K	639.000	633.700	632.100	627.700	622.900	619.200	616.900	615.400	613.200	611.000	609.700	609.600	607.800
12	3085K	607.800	601.500	596.900	595.400	590.900	588.200	585.500	583.400	579.900	578.200	577.100	575.100	574.100
13	3092K	627.600	621.900	619.200	615.800	612.200	607.200	603.900	602.100	600.800	599.600	598.600	597.100	595.500
14	3109K	625.600	621.700	621.000	618.700	615.000	610.300	607.800	604.000	602.800	601.500	599.800	598.800	596.800
15	3092K	643.600	638.300	636.300	635.300	631.200	625.200	623.800	620.300	619.300	617.000	616.000	614.600	612.600
16	3066K	627.300	619.800	617.100	613.800	607.400	604.300	603.100	600.500	598.200	596.000	595.400	594.000	591.500
17	3079K	632.900	628.900	624.700	623.600	620.800	614.800	613.500	612.000	611.100	610.300	608.900	607.400	606.500
18	3149K	631.300	625.100	622.200	620.300	615.800	613.600	610.500	610.100	608.900	606.600	605.300	604.100	601.700
19	3089K	651.500	646.400	643.500	640.400	636.900	635.800	633.100	632.800	631.200	630.000	628.800	626.800	624.900
20	3078K	636.200	634.700	630.300	628.800	628.400	623.600	621.800	620.900	618.700	615.900	615.200	613.900	613.100
21	3066K	636.400	632.000	630.100	627.800	626.900	624.000	620.000	619.100	616.100	614.300	612.700	611.900	609.700
22	3104K	634.100	628.400	625.400	624.100	622.900	617.600	613.900	613.100	611.200	609.000	608.100	607.600	605.100

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 55^{\circ}C$, $I_f = 200mA$; $T_s \geq 53^{\circ}C$ and $T_{air} \geq 50^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3082K	1.000	0.992	0.989	0.984	0.978	0.973	0.971	0.968	0.965	0.961	0.958	0.956	0.954
2	3057K	1.000	0.989	0.988	0.986	0.984	0.974	0.970	0.968	0.965	0.961	0.960	0.959	0.956
3	3088K	1.000	0.992	0.992	0.991	0.984	0.981	0.976	0.973	0.969	0.966	0.964	0.962	0.961
4	3094K	1.000	0.991	0.988	0.981	0.970	0.968	0.966	0.964	0.961	0.959	0.958	0.956	0.954
5	3082K	1.000	0.991	0.988	0.981	0.974	0.971	0.967	0.964	0.959	0.956	0.954	0.953	0.950
6	3098K	1.000	0.992	0.991	0.983	0.980	0.970	0.966	0.961	0.957	0.953	0.949	0.948	0.944
7	3081K	1.000	0.989	0.985	0.983	0.977	0.972	0.968	0.963	0.959	0.956	0.954	0.952	0.949
8	3075K	1.000	0.992	0.988	0.986	0.979	0.975	0.974	0.970	0.968	0.963	0.961	0.956	0.955
9	3123K	1.000	0.994	0.991	0.987	0.986	0.980	0.976	0.970	0.967	0.965	0.962	0.959	0.956
10	3094K	1.000	0.988	0.987	0.982	0.977	0.969	0.968	0.965	0.963	0.959	0.958	0.954	0.952
11	3100K	1.000	0.992	0.989	0.982	0.975	0.969	0.965	0.963	0.960	0.956	0.954	0.954	0.951
12	3085K	1.000	0.990	0.982	0.980	0.972	0.968	0.963	0.960	0.954	0.951	0.949	0.946	0.945
13	3092K	1.000	0.991	0.987	0.981	0.975	0.967	0.962	0.959	0.957	0.955	0.954	0.951	0.949
14	3109K	1.000	0.994	0.993	0.989	0.983	0.976	0.972	0.965	0.964	0.961	0.959	0.957	0.954
15	3092K	1.000	0.992	0.989	0.987	0.981	0.971	0.969	0.964	0.962	0.959	0.957	0.955	0.952
16	3066K	1.000	0.988	0.984	0.978	0.968	0.963	0.961	0.957	0.954	0.950	0.949	0.947	0.943
17	3079K	1.000	0.994	0.987	0.985	0.981	0.971	0.969	0.967	0.966	0.964	0.962	0.960	0.958
18	3149K	1.000	0.990	0.986	0.983	0.975	0.972	0.967	0.966	0.965	0.961	0.959	0.957	0.953
19	3089K	1.000	0.992	0.988	0.983	0.978	0.976	0.972	0.971	0.969	0.967	0.965	0.962	0.959
20	3078K	1.000	0.998	0.991	0.988	0.988	0.980	0.977	0.976	0.972	0.968	0.967	0.965	0.964
21	3066K	1.000	0.993	0.990	0.986	0.985	0.981	0.974	0.973	0.968	0.965	0.963	0.962	0.958
22	3104K	1.000	0.991	0.986	0.984	0.982	0.974	0.968	0.967	0.964	0.960	0.959	0.958	0.954

CIE 1976 u' data for tested units

$T_s = T_{air} = 55^\circ\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 53^\circ\text{C}$ and $T_{air} \geq 50^\circ\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3082K	0.2481	0.2478	0.2476	0.2475	0.2474	0.2476	0.2466	0.2465	0.2466	0.2464	0.2466	0.2465	0.2462
2	3057K	0.2487	0.2485	0.2483	0.2482	0.2491	0.2498	0.2478	0.2479	0.2473	0.2470	0.2472	0.2472	0.2469
3	3088K	0.2478	0.2475	0.2472	0.2473	0.2466	0.2469	0.2462	0.2467	0.2466	0.2465	0.2468	0.2467	0.2464
4	3094K	0.2475	0.2472	0.2469	0.2470	0.2460	0.2465	0.2463	0.2464	0.2462	0.2459	0.2461	0.2460	0.2465
5	3082K	0.2481	0.2479	0.2477	0.2476	0.2468	0.2472	0.2473	0.2473	0.2459	0.2459	0.2463	0.2461	0.2459
6	3098K	0.2474	0.2471	0.2468	0.2467	0.2464	0.2469	0.2475	0.2474	0.2460	0.2460	0.2463	0.2463	0.2460
7	3081K	0.2483	0.2480	0.2477	0.2477	0.2468	0.2468	0.2463	0.2460	0.2458	0.2457	0.2460	0.2460	0.2456
8	3075K	0.2481	0.2477	0.2474	0.2474	0.2473	0.2471	0.2473	0.2471	0.2466	0.2466	0.2468	0.2468	0.2464
9	3123K	0.2473	0.2469	0.2467	0.2467	0.2465	0.2463	0.2478	0.2477	0.2459	0.2457	0.2459	0.2459	0.2456
10	3094K	0.2477	0.2473	0.2471	0.2470	0.2470	0.2467	0.2465	0.2464	0.2462	0.2462	0.2465	0.2464	0.2461
11	3100K	0.2477	0.2474	0.2472	0.2470	0.2474	0.2468	0.2468	0.2467	0.2470	0.2467	0.2470	0.2469	0.2466
12	3085K	0.2480	0.2482	0.2480	0.2477	0.2470	0.2467	0.2471	0.2471	0.2467	0.2466	0.2461	0.2467	0.2464
13	3092K	0.2479	0.2477	0.2476	0.2472	0.2474	0.2472	0.2472	0.2471	0.2466	0.2465	0.2461	0.2465	0.2462
14	3109K	0.2473	0.2470	0.2470	0.2467	0.2470	0.2471	0.2470	0.2469	0.2460	0.2458	0.2454	0.2451	0.2453
15	3092K	0.2478	0.2474	0.2475	0.2472	0.2468	0.2468	0.2472	0.2473	0.2478	0.2468	0.2468	0.2467	0.2465
16	3066K	0.2487	0.2482	0.2483	0.2480	0.2479	0.2480	0.2474	0.2472	0.2466	0.2466	0.2467	0.2468	0.2465
17	3079K	0.2481	0.2475	0.2474	0.2473	0.2474	0.2475	0.2471	0.2472	0.2466	0.2466	0.2468	0.2467	0.2465
18	3149K	0.2463	0.2454	0.2456	0.2455	0.2454	0.2457	0.2453	0.2454	0.2449	0.2448	0.2449	0.2450	0.2446
19	3089K	0.2479	0.2472	0.2468	0.2469	0.2473	0.2474	0.2483	0.2487	0.2469	0.2468	0.2469	0.2469	0.2466
20	3078K	0.2481	0.2476	0.2474	0.2474	0.2469	0.2467	0.2466	0.2467	0.2473	0.2475	0.2477	0.2477	0.2475
21	3066K	0.2486	0.2482	0.2478	0.2478	0.2481	0.2479	0.2473	0.2475	0.2474	0.2473	0.2474	0.2472	0.2469
22	3104K	0.2474	0.2471	0.2466	0.2466	0.2482	0.2478	0.2466	0.2463	0.2462	0.2466	0.2462	0.2461	0.2458

CIE 1976 v' data for tested units

$T_s = T_{air} = 55^\circ\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 53^\circ\text{C}$ and $T_{air} \geq 50^\circ\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3082K	0.5184	0.5178	0.5177	0.5174	0.5171	0.5170	0.5175	0.5168	0.5162	0.5157	0.5154	0.5151	0.5149
2	3057K	0.5198	0.5192	0.5191	0.5190	0.5193	0.5210	0.5180	0.5176	0.5172	0.5168	0.5165	0.5162	0.5159
3	3088K	0.5186	0.5181	0.5179	0.5178	0.5169	0.5169	0.5172	0.5169	0.5163	0.5159	0.5157	0.5154	0.5151
4	3094K	0.5189	0.5183	0.5181	0.5180	0.5173	0.5170	0.5169	0.5161	0.5167	0.5162	0.5158	0.5156	0.5151
5	3082K	0.5183	0.5179	0.5176	0.5174	0.5171	0.5165	0.5163	0.5163	0.5163	0.5159	0.5158	0.5154	0.5153
6	3098K	0.5187	0.5183	0.5180	0.5177	0.5167	0.5160	0.5158	0.5158	0.5160	0.5159	0.5157	0.5154	0.5151
7	3081K	0.5177	0.5173	0.5169	0.5167	0.5172	0.5165	0.5164	0.5162	0.5162	0.5161	0.5159	0.5158	0.5153
8	3075K	0.5193	0.5188	0.5185	0.5183	0.5185	0.5181	0.5176	0.5176	0.5171	0.5170	0.5167	0.5166	0.5162
9	3123K	0.5156	0.5151	0.5147	0.5146	0.5146	0.5143	0.5173	0.5173	0.5136	0.5130	0.5127	0.5125	0.5122
10	3094K	0.5181	0.5175	0.5173	0.5171	0.5169	0.5167	0.5165	0.5163	0.5161	0.5155	0.5153	0.5152	0.5147
11	3100K	0.5173	0.5167	0.5165	0.5163	0.5165	0.5166	0.5162	0.5163	0.5158	0.5151	0.5149	0.5147	0.5143
12	3085K	0.5183	0.5182	0.5180	0.5181	0.5173	0.5171	0.5161	0.5163	0.5160	0.5157	0.5154	0.5154	0.5150
13	3092K	0.5177	0.5172	0.5170	0.5171	0.5170	0.5172	0.5167	0.5164	0.5159	0.5158	0.5154	0.5148	0.5147
14	3109K	0.5175	0.5168	0.5166	0.5167	0.5167	0.5170	0.5164	0.5161	0.5162	0.5157	0.5154	0.5146	0.5140
15	3092K	0.5181	0.5174	0.5172	0.5173	0.5169	0.5169	0.5171	0.5170	0.5194	0.5170	0.5159	0.5157	0.5157
16	3066K	0.5185	0.5176	0.5174	0.5174	0.5168	0.5168	0.5165	0.5162	0.5160	0.5160	0.5157	0.5158	0.5157
17	3079K	0.5188	0.5179	0.5176	0.5178	0.5173	0.5172	0.5166	0.5165	0.5160	0.5158	0.5154	0.5152	0.5151
18	3149K	0.5158	0.5151	0.5147	0.5147	0.5145	0.5142	0.5147	0.5148	0.5143	0.5142	0.5136	0.5136	0.5132
19	3089K	0.5181	0.5173	0.5169	0.5167	0.5170	0.5172	0.5196	0.5192	0.5162	0.5159	0.5154	0.5152	0.5150
20	3078K	0.5190	0.5185	0.5181	0.5179	0.5171	0.5164	0.5168	0.5169	0.5159	0.5163	0.5161	0.5161	0.5160
21	3066K	0.5188	0.5182	0.5179	0.5177	0.5177	0.5170	0.5163	0.5166	0.5169	0.5165	0.5160	0.5155	0.5151
22	3104K	0.5178	0.5173	0.5169	0.5167	0.5176	0.5174	0.5165	0.5157	0.5160	0.5159	0.5155	0.5151	0.5146

Delta u'v' data for tested units

$T_s = T_{air} = 55^{\circ}\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 53^{\circ}\text{C}$ and $T_{air} \geq 50^{\circ}\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3082K	0.0000	0.0007	0.0009	0.0012	0.0015	0.0015	0.0017	0.0023	0.0027	0.0032	0.0034	0.0037	0.0040
2	3057K	0.0000	0.0006	0.0008	0.0009	0.0006	0.0016	0.0020	0.0023	0.0030	0.0034	0.0036	0.0039	0.0043
3	3088K	0.0000	0.0006	0.0009	0.0009	0.0021	0.0019	0.0021	0.0020	0.0026	0.0030	0.0031	0.0034	0.0038
4	3094K	0.0000	0.0007	0.0010	0.0010	0.0022	0.0021	0.0023	0.0030	0.0026	0.0031	0.0034	0.0036	0.0039
5	3082K	0.0000	0.0004	0.0008	0.0010	0.0018	0.0020	0.0022	0.0022	0.0030	0.0033	0.0031	0.0035	0.0037
6	3098K	0.0000	0.0005	0.0009	0.0012	0.0022	0.0027	0.0029	0.0029	0.0030	0.0031	0.0032	0.0035	0.0039
7	3081K	0.0000	0.0005	0.0010	0.0012	0.0016	0.0019	0.0024	0.0027	0.0029	0.0031	0.0029	0.0030	0.0036
8	3075K	0.0000	0.0006	0.0011	0.0012	0.0011	0.0016	0.0019	0.0020	0.0027	0.0027	0.0029	0.0030	0.0035
9	3123K	0.0000	0.0006	0.0011	0.0012	0.0013	0.0016	0.0018	0.0017	0.0024	0.0031	0.0032	0.0034	0.0038
10	3094K	0.0000	0.0007	0.0010	0.0012	0.0014	0.0017	0.0020	0.0022	0.0024	0.0030	0.0030	0.0032	0.0038
11	3100K	0.0000	0.0007	0.0009	0.0012	0.0009	0.0011	0.0014	0.0014	0.0017	0.0024	0.0025	0.0027	0.0032
12	3085K	0.0000	0.0002	0.0003	0.0004	0.0014	0.0018	0.0024	0.0022	0.0026	0.0030	0.0035	0.0032	0.0037
13	3092K	0.0000	0.0005	0.0008	0.0009	0.0009	0.0009	0.0012	0.0015	0.0022	0.0024	0.0029	0.0032	0.0034
14	3109K	0.0000	0.0008	0.0009	0.0010	0.0009	0.0005	0.0011	0.0015	0.0018	0.0023	0.0028	0.0036	0.0040
15	3092K	0.0000	0.0008	0.0009	0.0010	0.0016	0.0016	0.0012	0.0012	0.0013	0.0015	0.0024	0.0026	0.0027
16	3066K	0.0000	0.0010	0.0012	0.0013	0.0019	0.0018	0.0024	0.0027	0.0033	0.0033	0.0034	0.0033	0.0036
17	3079K	0.0000	0.0011	0.0014	0.0013	0.0017	0.0017	0.0024	0.0025	0.0032	0.0034	0.0036	0.0039	0.0040
18	3149K	0.0000	0.0011	0.0013	0.0014	0.0016	0.0017	0.0015	0.0013	0.0021	0.0022	0.0026	0.0026	0.0031
19	3089K	0.0000	0.0011	0.0016	0.0017	0.0013	0.0010	0.0016	0.0014	0.0021	0.0025	0.0029	0.0031	0.0034
20	3078K	0.0000	0.0007	0.0011	0.0013	0.0022	0.0030	0.0027	0.0025	0.0032	0.0028	0.0029	0.0029	0.0031
21	3066K	0.0000	0.0007	0.0012	0.0014	0.0012	0.0019	0.0028	0.0025	0.0022	0.0026	0.0030	0.0036	0.0041
22	3104K	0.0000	0.0006	0.0012	0.0014	0.0008	0.0006	0.0015	0.0024	0.0022	0.0021	0.0026	0.0030	0.0036

Forward Voltage [V] data for tested units

$T_s = T_{air} = 55^{\circ}\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 53^{\circ}\text{C}$ and $T_{air} \geq 50^{\circ}\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3082K	25.920	26.160	25.910	25.920	25.950	25.920	26.090	26.240	26.380	26.400	26.270	26.540	26.320
2	3057K	26.250	26.540	26.250	26.260	26.320	26.250	26.160	26.360	26.570	26.500	26.400	26.410	26.400
3	3088K	26.160	26.520	26.170	26.200	26.230	26.200	26.460	26.650	26.500	26.460	26.370	26.380	26.370
4	3094K	26.470	26.640	26.480	26.520	26.540	26.520	26.330	26.500	26.660	26.640	26.500	26.540	26.060
5	3082K	26.190	26.290	26.190	26.230	26.240	26.260	26.470	26.650	26.290	26.320	26.230	26.200	26.240
6	3098K	26.050	26.210	26.050	26.080	26.380	26.380	26.370	26.550	26.280	26.230	26.160	26.160	26.160
7	3081K	26.340	26.460	26.320	26.380	26.450	26.470	26.170	26.340	26.260	26.290	26.140	26.160	26.150
8	3075K	26.270	26.410	26.270	26.330	26.310	26.310	26.300	26.460	26.370	26.460	26.360	26.360	26.360
9	3123K	26.220	26.400	26.200	26.270	26.270	26.260	26.320	26.520	26.320	26.450	26.290	26.290	26.310
10	3094K	26.150	26.160	26.130	26.200	26.190	26.150	26.110	26.240	26.340	26.350	26.220	26.250	26.230
11	3100K	26.140	26.180	26.140	26.220	26.150	26.120	26.280	26.500	26.460	26.540	26.450	26.470	26.440
12	3085K	26.120	26.310	26.300	26.330	25.990	26.000	25.880	26.060	26.420	26.390	26.250	26.250	26.240
13	3092K	25.860	25.960	25.950	25.970	26.040	25.980	26.020	26.140	26.290	26.400	26.240	26.260	26.240
14	3109K	26.060	26.130	26.120	26.140	26.020	25.970	26.140	26.410	26.510	26.540	26.400	26.410	26.430
15	3092K	26.170	26.250	26.220	26.270	26.170	26.150	26.200	26.360	26.260	26.200	26.050	26.060	26.070
16	3066K	26.240	26.280	26.270	26.290	26.260	26.250	26.070	26.210	26.120	26.310	26.060	26.060	26.070
17	3079K	26.250	26.300	26.390	26.320	26.300	26.310	26.420	26.610	26.120	26.250	26.060	26.030	26.040
18	3149K	26.280	26.320	26.320	26.340	26.380	26.340	26.360	26.550	26.690	26.550	26.450	26.450	26.440
19	3089K	26.090	26.130	26.120	26.130	26.210	26.200	26.260	26.400	26.160	26.280	26.110	26.110	26.120
20	3078K	26.130	26.190	26.240	26.190	26.090	26.090	26.040	26.210	26.350	26.360	26.190	26.230	26.190
21	3066K	26.250	26.300	26.280	26.310	26.290	26.310	26.310	26.490	26.520	26.580	26.340	26.330	26.350
22	3104K	25.990	26.040	26.080	26.020	26.340	26.350	26.030	26.230	26.220	26.260	26.080	26.090	26.110

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 85^{\circ}\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 83^{\circ}\text{C}$ and $T_{air} \geq 80^{\circ}\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3073K	643.500	634.700	631.500	630.300	625.200	619.600	616.800	614.500	611.000	609.700	608.600	606.800	604.500
2	3090K	632.300	625.500	622.800	619.100	611.700	606.600	605.000	601.900	599.300	596.700	595.500	593.200	591.600
3	3095K	640.000	634.600	631.400	627.800	621.800	618.600	613.700	610.500	608.500	605.400	602.600	600.400	598.200
4	3073K	647.600	641.700	637.000	633.500	629.200	622.600	621.200	617.500	614.300	612.000	610.400	609.700	607.200
5	3086K	633.600	627.200	624.000	622.300	616.800	615.500	613.600	612.600	610.100	607.900	605.100	602.800	601.100
6	3063K	641.700	633.100	630.400	625.500	620.500	614.400	611.400	609.000	606.400	604.300	603.100	599.700	597.800
7	3058K	649.200	641.800	639.800	634.000	628.300	622.100	617.200	615.000	613.400	610.600	608.200	605.700	603.600
8	3064K	641.700	633.600	632.200	628.000	622.900	619.800	619.700	618.300	615.900	613.200	610.400	609.000	608.100
9	3060K	648.200	640.600	639.000	636.200	632.300	626.500	625.800	624.300	622.100	619.800	617.900	614.800	611.900
10	3070K	658.100	649.100	644.400	640.500	634.900	632.300	628.400	623.300	620.800	617.900	616.000	615.100	613.900
11	3087K	637.300	630.600	627.200	623.300	620.600	615.400	614.500	609.900	608.200	604.700	602.800	600.600	598.400
12	3078K	648.500	640.900	637.000	636.800	634.400	630.200	628.700	626.300	624.500	623.500	621.000	619.800	619.000
13	3082K	651.400	646.500	641.800	640.500	638.200	633.000	630.000	627.200	623.700	621.600	619.800	617.100	614.700
14	3100K	649.000	648.000	644.600	640.400	636.900	631.800	629.900	625.500	621.900	620.600	617.900	615.700	614.400
15	3058K	656.600	650.200	647.300	651.400	646.600	643.500	640.600	637.600	635.200	632.800	630.900	629.800	628.600
16	3073K	636.100	630.900	627.800	624.400	619.800	615.400	613.500	611.100	608.700	606.300	605.300	603.400	601.200
17	3087K	648.500	644.200	640.800	638.300	632.300	627.700	623.800	622.700	620.200	618.700	616.600	614.500	612.700
18	3081K	642.800	638.300	637.800	632.900	629.700	626.300	624.300	620.800	618.700	616.200	613.500	613.100	611.900
19	3117K	640.400	633.100	632.800	628.600	625.300	623.800	622.400	620.500	618.500	616.200	613.400	612.100	609.700
20	3089K	634.700	627.900	625.300	618.700	614.800	611.000	607.000	604.700	601.900	598.800	596.100	593.500	590.700
21	3066K	646.000	637.100	635.300	629.800	623.700	621.500	620.000	616.900	612.200	608.200	605.900	603.600	600.800
22	3079K	652.600	648.100	646.500	642.100	637.000	636.900	632.200	631.400	628.000	625.700	624.300	621.500	619.600

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 85^{\circ}\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 83^{\circ}\text{C}$ and $T_{air} \geq 80^{\circ}\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3073K	1.000	0.986	0.981	0.979	0.972	0.963	0.959	0.955	0.949	0.947	0.946	0.943	0.939
2	3090K	1.000	0.989	0.985	0.979	0.967	0.959	0.957	0.952	0.948	0.944	0.942	0.938	0.936
3	3095K	1.000	0.992	0.987	0.981	0.972	0.967	0.959	0.954	0.951	0.946	0.942	0.938	0.935
4	3073K	1.000	0.991	0.984	0.978	0.972	0.961	0.959	0.954	0.949	0.945	0.943	0.941	0.938
5	3086K	1.000	0.990	0.985	0.982	0.973	0.971	0.968	0.967	0.963	0.959	0.955	0.951	0.949
6	3063K	1.000	0.987	0.982	0.975	0.967	0.957	0.953	0.949	0.945	0.942	0.940	0.935	0.932
7	3058K	1.000	0.989	0.986	0.977	0.968	0.958	0.951	0.947	0.945	0.941	0.937	0.933	0.930
8	3064K	1.000	0.987	0.985	0.979	0.971	0.966	0.966	0.964	0.960	0.956	0.951	0.949	0.948
9	3060K	1.000	0.988	0.986	0.981	0.975	0.967	0.965	0.963	0.960	0.956	0.953	0.948	0.944
10	3070K	1.000	0.986	0.979	0.973	0.965	0.961	0.955	0.947	0.943	0.939	0.936	0.935	0.933
11	3087K	1.000	0.989	0.984	0.978	0.974	0.966	0.964	0.957	0.954	0.949	0.946	0.942	0.939
12	3078K	1.000	0.988	0.982	0.982	0.978	0.972	0.969	0.966	0.963	0.961	0.958	0.956	0.955
13	3082K	1.000	0.992	0.985	0.983	0.980	0.972	0.967	0.963	0.957	0.954	0.951	0.947	0.944
14	3100K	1.000	0.998	0.993	0.987	0.981	0.973	0.971	0.964	0.958	0.956	0.952	0.949	0.947
15	3058K	1.000	0.990	0.986	0.992	0.985	0.980	0.976	0.971	0.967	0.964	0.961	0.959	0.957
16	3073K	1.000	0.992	0.987	0.982	0.974	0.967	0.964	0.961	0.957	0.953	0.952	0.949	0.945
17	3087K	1.000	0.993	0.988	0.984	0.975	0.968	0.962	0.960	0.956	0.954	0.951	0.948	0.945
18	3081K	1.000	0.993	0.992	0.985	0.980	0.974	0.971	0.966	0.963	0.959	0.954	0.954	0.952
19	3117K	1.000	0.989	0.988	0.982	0.976	0.974	0.972	0.969	0.966	0.962	0.958	0.956	0.952
20	3089K	1.000	0.989	0.985	0.975	0.969	0.963	0.956	0.953	0.948	0.943	0.939	0.935	0.931
21	3066K	1.000	0.986	0.983	0.975	0.965	0.962	0.960	0.955	0.948	0.941	0.938	0.934	0.930
22	3079K	1.000	0.993	0.991	0.984	0.976	0.976	0.969	0.968	0.962	0.959	0.957	0.952	0.949

CIE 1976 u' data for tested units

$T_s = T_{air} = 85^{\circ}\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 83^{\circ}\text{C}$ and $T_{air} \geq 80^{\circ}\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3073K	0.2484	0.2480	0.2477	0.2475	0.2475	0.2474	0.2472	0.2470	0.2468	0.2467	0.2468	0.2469	0.2467
2	3090K	0.2478	0.2472	0.2470	0.2470	0.2469	0.2472	0.2476	0.2473	0.2467	0.2465	0.2464	0.2462	0.2459
3	3095K	0.2476	0.2472	0.2469	0.2467	0.2454	0.2454	0.2465	0.2470	0.2461	0.2462	0.2464	0.2466	0.2462
4	3073K	0.2482	0.2478	0.2475	0.2474	0.2470	0.2467	0.2457	0.2460	0.2466	0.2468	0.2471	0.2471	0.2470
5	3086K	0.2480	0.2477	0.2473	0.2472	0.2486	0.2483	0.2478	0.2481	0.2474	0.2473	0.2474	0.2471	0.2469
6	3063K	0.2486	0.2480	0.2480	0.2478	0.2476	0.2481	0.2469	0.2472	0.2469	0.2470	0.2473	0.2471	0.2468
7	3058K	0.2486	0.2474	0.2477	0.2476	0.2473	0.2479	0.2472	0.2466	0.2466	0.2466	0.2469	0.2468	0.2465
8	3064K	0.2484	0.2477	0.2473	0.2475	0.2469	0.2480	0.2477	0.2473	0.2467	0.2464	0.2464	0.2463	0.2460
9	3060K	0.2487	0.2480	0.2479	0.2479	0.2474	0.2477	0.2478	0.2473	0.2471	0.2471	0.2472	0.2472	0.2469
10	3070K	0.2484	0.2475	0.2474	0.2474	0.2484	0.2474	0.2478	0.2465	0.2470	0.2467	0.2468	0.2466	0.2463
11	3087K	0.2480	0.2475	0.2471	0.2471	0.2462	0.2469	0.2472	0.2468	0.2467	0.2464	0.2465	0.2463	0.2460
12	3078K	0.2482	0.2475	0.2473	0.2472	0.2466	0.2470	0.2472	0.2471	0.2470	0.2467	0.2466	0.2465	0.2462
13	3082K	0.2479	0.2474	0.2471	0.2470	0.2464	0.2467	0.2462	0.2468	0.2465	0.2462	0.2464	0.2463	0.2461
14	3100K	0.2473	0.2473	0.2470	0.2468	0.2465	0.2466	0.2467	0.2466	0.2463	0.2464	0.2468	0.2467	0.2465
15	3058K	0.2489	0.2483	0.2481	0.2480	0.2485	0.2493	0.2483	0.2474	0.2473	0.2471	0.2472	0.2472	0.2469
16	3073K	0.2484	0.2479	0.2475	0.2475	0.2471	0.2477	0.2484	0.2473	0.2470	0.2468	0.2469	0.2469	0.2466
17	3087K	0.2477	0.2471	0.2468	0.2467	0.2465	0.2474	0.2488	0.2475	0.2464	0.2464	0.2467	0.2466	0.2464
18	3081K	0.2479	0.2474	0.2472	0.2471	0.2460	0.2473	0.2474	0.2467	0.2465	0.2464	0.2464	0.2463	0.2460
19	3117K	0.2472	0.2467	0.2464	0.2463	0.2461	0.2465	0.2461	0.2459	0.2458	0.2458	0.2459	0.2459	0.2454
20	3089K	0.2477	0.2473	0.2470	0.2469	0.2467	0.2472	0.2466	0.2463	0.2462	0.2462	0.2464	0.2462	0.2459
21	3066K	0.2486	0.2481	0.2479	0.2478	0.2476	0.2479	0.2477	0.2472	0.2470	0.2471	0.2473	0.2472	0.2468
22	3079K	0.2482	0.2476	0.2472	0.2473	0.2481	0.2468	0.2473	0.2470	0.2466	0.2467	0.2468	0.2467	0.2464

CIE 1976 v' data for tested units

$T_s = T_{air} = 85^{\circ}\text{C}$, $I_f = 200\text{mA}$; $T_s \geq 83^{\circ}\text{C}$ and $T_{air} \geq 80^{\circ}\text{C}$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3073K	0.5186	0.5179	0.5175	0.5175	0.5170	0.5165	0.5169	0.5161	0.5160	0.5157	0.5152	0.5152	0.5152
2	3090K	0.5183	0.5177	0.5173	0.5172	0.5169	0.5165	0.5169	0.5173	0.5174	0.5167	0.5156	0.5150	0.5146
3	3095K	0.5184	0.5178	0.5174	0.5170	0.5163	0.5148	0.5162	0.5158	0.5157	0.5160	0.5155	0.5159	0.5155
4	3073K	0.5193	0.5186	0.5183	0.5180	0.5187	0.5177	0.5169	0.5160	0.5153	0.5156	0.5155	0.5157	0.5157
5	3086K	0.5181	0.5175	0.5172	0.5169	0.5172	0.5179	0.5172	0.5171	0.5168	0.5165	0.5158	0.5148	0.5150
6	3063K	0.5193	0.5183	0.5182	0.5178	0.5169	0.5175	0.5171	0.5161	0.5158	0.5160	0.5160	0.5154	0.5153
7	3058K	0.5199	0.5186	0.5178	0.5175	0.5165	0.5172	0.5165	0.5163	0.5154	0.5156	0.5155	0.5150	0.5149
8	3064K	0.5199	0.5197	0.5191	0.5185	0.5179	0.5181	0.5181	0.5181	0.5181	0.5171	0.5165	0.5161	0.5159
9	3060K	0.5193	0.5192	0.5188	0.5180	0.5177	0.5174	0.5172	0.5171	0.5172	0.5170	0.5163	0.5164	0.5163
10	3070K	0.5189	0.5184	0.5181	0.5174	0.5174	0.5169	0.5173	0.5178	0.5171	0.5162	0.5156	0.5151	0.5148
11	3087K	0.5180	0.5175	0.5173	0.5165	0.5165	0.5159	0.5161	0.5159	0.5160	0.5152	0.5144	0.5141	0.5138
12	3078K	0.5185	0.5178	0.5177	0.5169	0.5167	0.5162	0.5164	0.5163	0.5166	0.5159	0.5149	0.5147	0.5142
13	3082K	0.5191	0.5185	0.5182	0.5175	0.5173	0.5167	0.5168	0.5170	0.5171	0.5164	0.5159	0.5156	0.5155
14	3100K	0.5188	0.5186	0.5181	0.5175	0.5176	0.5167	0.5164	0.5156	0.5151	0.5155	0.5157	0.5154	0.5154
15	3058K	0.5189	0.5185	0.5181	0.5176	0.5173	0.5185	0.5183	0.5189	0.5175	0.5169	0.5164	0.5162	0.5160
16	3073K	0.5186	0.5183	0.5178	0.5172	0.5172	0.5160	0.5169	0.5171	0.5171	0.5165	0.5160	0.5158	0.5156
17	3087K	0.5191	0.5187	0.5184	0.5177	0.5176	0.5174	0.5169	0.5161	0.5162	0.5161	0.5162	0.5160	0.5160
18	3081K	0.5192	0.5189	0.5186	0.5179	0.5172	0.5168	0.5173	0.5169	0.5168	0.5167	0.5158	0.5155	0.5150
19	3117K	0.5168	0.5164	0.5161	0.5154	0.5153	0.5142	0.5144	0.5141	0.5142	0.5143	0.5139	0.5137	0.5130
20	3089K	0.5188	0.5185	0.5181	0.5175	0.5173	0.5162	0.5164	0.5162	0.5162	0.5163	0.5162	0.5156	0.5152
21	3066K	0.5188	0.5185	0.5182	0.5175	0.5173	0.5161	0.5166	0.5163	0.5163	0.5165	0.5161	0.5158	0.5153
22	3079K	0.5184	0.5180	0.5177	0.5170	0.5173	0.5168	0.5161	0.5158	0.5158	0.5159	0.5155	0.5152	0.5147

Delta u'v' data for tested units

T_s = T_{air} = 85°C, I_f = 200mA; T_s ≥ 83°C and T_{air} ≥ 80°C in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3073K	0.0000	0.0008	0.0013	0.0014	0.0018	0.0023	0.0021	0.0029	0.0031	0.0034	0.0038	0.0037	0.0038
2	3090K	0.0000	0.0008	0.0013	0.0014	0.0017	0.0019	0.0014	0.0011	0.0014	0.0021	0.0030	0.0037	0.0042
3	3095K	0.0000	0.0007	0.0012	0.0017	0.0030	0.0042	0.0025	0.0027	0.0031	0.0028	0.0031	0.0027	0.0032
4	3073K	0.0000	0.0008	0.0012	0.0015	0.0013	0.0022	0.0035	0.0040	0.0043	0.0040	0.0040	0.0038	0.0038
5	3086K	0.0000	0.0007	0.0011	0.0014	0.0011	0.0004	0.0009	0.0010	0.0014	0.0017	0.0024	0.0034	0.0033
6	3063K	0.0000	0.0012	0.0013	0.0017	0.0026	0.0019	0.0028	0.0035	0.0039	0.0037	0.0035	0.0042	0.0044
7	3058K	0.0000	0.0018	0.0023	0.0026	0.0036	0.0028	0.0037	0.0041	0.0049	0.0047	0.0047	0.0052	0.0054
8	3064K	0.0000	0.0007	0.0014	0.0017	0.0025	0.0018	0.0019	0.0021	0.0025	0.0034	0.0039	0.0043	0.0047
9	3060K	0.0000	0.0007	0.0009	0.0015	0.0021	0.0021	0.0023	0.0026	0.0026	0.0028	0.0034	0.0033	0.0035
10	3070K	0.0000	0.0010	0.0013	0.0018	0.0015	0.0022	0.0017	0.0022	0.0023	0.0032	0.0037	0.0042	0.0046
11	3087K	0.0000	0.0007	0.0011	0.0017	0.0023	0.0024	0.0021	0.0024	0.0024	0.0032	0.0039	0.0043	0.0047
12	3078K	0.0000	0.0010	0.0012	0.0019	0.0024	0.0026	0.0023	0.0025	0.0022	0.0030	0.0039	0.0042	0.0047
13	3082K	0.0000	0.0008	0.0012	0.0018	0.0023	0.0027	0.0029	0.0024	0.0024	0.0032	0.0035	0.0038	0.0040
14	3100K	0.0000	0.0002	0.0008	0.0014	0.0014	0.0022	0.0025	0.0033	0.0038	0.0034	0.0031	0.0035	0.0035
15	3058K	0.0000	0.0007	0.0011	0.0016	0.0016	0.0006	0.0008	0.0015	0.0021	0.0027	0.0030	0.0032	0.0035
16	3073K	0.0000	0.0006	0.0012	0.0017	0.0019	0.0027	0.0017	0.0019	0.0021	0.0026	0.0030	0.0032	0.0035
17	3087K	0.0000	0.0007	0.0011	0.0017	0.0019	0.0017	0.0025	0.0030	0.0032	0.0033	0.0031	0.0033	0.0034
18	3081K	0.0000	0.0006	0.0009	0.0015	0.0028	0.0025	0.0020	0.0026	0.0028	0.0029	0.0037	0.0040	0.0046
19	3117K	0.0000	0.0006	0.0011	0.0017	0.0019	0.0027	0.0026	0.0030	0.0030	0.0029	0.0032	0.0034	0.0042
20	3089K	0.0000	0.0005	0.0010	0.0015	0.0018	0.0026	0.0026	0.0030	0.0030	0.0029	0.0029	0.0035	0.0040
21	3066K	0.0000	0.0006	0.0009	0.0015	0.0018	0.0028	0.0024	0.0029	0.0030	0.0027	0.0030	0.0033	0.0039
22	3079K	0.0000	0.0007	0.0012	0.0017	0.0011	0.0021	0.0025	0.0029	0.0031	0.0029	0.0032	0.0035	0.0041

Forward Voltage [V] data for tested units

T_s = T_{air} = 85°C, I_f = 200mA; T_s ≥ 83°C and T_{air} ≥ 80°C in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3073K	26.040	26.090	26.020	26.090	26.110	26.090	26.380	26.620	26.440	26.490	26.320	26.330	26.330
2	3090K	25.930	26.010	25.920	25.990	26.270	26.250	26.000	26.190	26.170	26.210	26.040	26.040	26.050
3	3095K	26.440	26.050	26.040	26.180	26.190	26.190	26.010	26.180	26.370	26.380	26.240	26.250	26.240
4	3073K	25.990	26.050	25.950	25.990	26.090	26.080	26.350	26.620	26.040	26.100	25.950	25.980	25.950
5	3086K	26.450	26.500	26.430	26.480	25.990	26.010	26.150	26.380	26.480	26.500	26.350	26.360	26.350
6	3063K	26.340	26.420	26.320	26.330	26.320	26.340	26.330	26.550	26.520	26.570	26.440	26.390	26.400
7	3058K	26.240	26.050	25.980	26.000	26.010	26.020	25.980	26.140	26.170	26.270	26.080	26.080	26.070
8	3064K	26.030	26.190	26.000	26.030	26.030	26.070	26.000	26.260	26.270	26.300	26.150	26.170	26.150
9	3060K	25.870	25.940	25.860	25.900	25.870	25.900	25.880	26.120	26.430	26.440	26.290	26.300	26.310
10	3070K	26.370	26.340	26.310	26.360	26.290	26.350	26.360	26.290	26.530	26.530	26.400	26.400	26.390
11	3087K	26.040	26.030	26.010	26.040	26.030	26.070	26.080	26.330	26.240	26.290	26.110	26.140	26.110
12	3078K	25.890	25.950	25.830	25.860	25.840	25.880	25.880	26.120	26.020	26.120	25.920	25.950	25.900
13	3082K	26.020	26.090	25.980	26.010	26.000	26.010	26.040	26.220	26.250	26.300	26.050	26.080	26.050
14	3100K	26.010	26.190	26.000	26.050	26.010	26.030	26.420	26.620	26.490	26.520	26.360	26.390	26.360
15	3058K	26.160	26.210	26.110	26.180	26.110	26.130	26.110	26.310	26.860	26.690	26.530	26.550	26.540
16	3073K	26.400	26.780	26.360	26.410	26.370	26.420	26.220	26.450	26.610	26.610	26.440	26.460	26.450
17	3087K	26.090	26.170	26.070	26.110	26.050	26.080	26.250	26.480	26.190	26.270	26.070	26.100	26.120
18	3081K	26.030	26.060	26.030	26.050	26.040	26.070	26.050	26.280	26.250	26.300	26.090	26.120	26.130
19	3117K	26.160	26.160	26.140	26.170	26.110	26.130	26.130	26.320	26.340	26.380	26.200	26.230	26.220
20	3089K	26.280	26.290	26.260	26.300	26.250	26.260	26.270	26.480	26.520	26.460	26.400	26.350	26.350
21	3066K	26.200	26.200	26.210	26.230	26.170	26.170	26.210	26.360	26.320	26.430	26.250	26.260	26.240
22	3079K	26.150	26.170	26.140	26.180	26.110	26.120	26.140	26.370	26.330	26.380	26.220	26.220	26.200

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 105^{\circ}C, I_f = 200mA; T_s \geq 103^{\circ}C$ and $T_{air} \geq 100^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3081K	639.000	632.700	629.300	624.900	618.100	612.900	609.000	606.200	602.300	599.400	596.800	593.900	590.900
2	3065K	645.400	638.900	633.900	629.700	626.500	620.600	615.200	614.300	611.000	607.800	605.100	600.900	599.200
3	3086K	648.000	642.500	639.400	635.200	629.400	626.400	622.800	619.300	615.700	611.300	608.000	605.600	603.700
4	3082K	639.600	632.900	630.300	625.000	619.700	613.700	609.500	606.900	602.200	598.800	595.700	592.300	588.600
5	3071K	648.500	642.200	639.200	633.400	627.400	624.600	621.300	617.400	614.200	612.200	610.400	607.600	604.900
6	3097K	648.200	644.000	639.900	636.600	631.500	629.800	627.700	625.400	621.400	617.200	615.000	611.400	608.500
7	3074K	635.700	628.500	626.400	622.000	617.000	610.700	606.000	601.100	596.200	592.700	589.700	587.700	584.900
8	3069K	633.800	627.300	623.500	621.200	615.900	611.300	605.600	601.300	597.600	594.700	592.500	588.700	586.500
9	3078K	641.500	635.600	629.100	626.600	615.100	608.500	606.200	603.100	599.300	597.300	594.500	590.900	588.200
10	3154K	637.900	631.700	626.500	622.100	618.900	611.400	610.400	607.300	604.300	602.000	598.600	595.500	592.200
11	3081K	639.000	631.900	629.200	626.100	618.900	616.500	613.800	609.100	606.400	602.600	600.400	597.900	594.900
12	3081K	639.400	633.800	627.900	625.300	618.100	613.400	613.000	608.700	605.100	600.900	599.300	598.000	594.600
13	3085K	632.300	626.200	619.400	615.300	608.800	603.200	601.600	598.500	596.600	592.500	589.300	587.300	583.800
14	3066K	643.200	634.400	629.600	625.500	618.100	614.900	612.200	607.800	604.100	599.900	596.800	594.300	591.400
15	3099K	632.800	626.800	622.900	616.900	612.400	607.300	605.800	601.100	597.800	595.500	592.500	589.400	587.600
16	3094K	638.000	632.700	628.000	621.300	615.400	609.100	607.700	604.900	600.500	596.500	594.700	590.600	588.600
17	3111K	636.000	630.200	626.600	622.700	615.000	612.800	610.900	608.500	605.700	603.000	600.900	598.200	596.100
18	3088K	636.800	629.800	628.200	622.200	615.700	609.700	602.400	601.000	599.400	595.400	592.700	589.500	586.400
19	3085K	641.900	634.900	631.200	626.200	620.900	617.200	612.700	610.600	608.100	604.700	601.300	598.800	596.200
20	3079K	632.000	627.100	621.100	615.000	607.400	604.900	600.200	597.500	594.900	590.800	588.200	586.600	584.600
21	3066K	636.300	627.000	621.300	616.100	612.100	612.000	606.300	604.000	601.900	599.200	597.100	594.100	590.800
22	3070K	644.500	635.700	631.800	626.100	625.200	620.300	613.900	612.100	610.100	607.700	605.700	602.900	600.500

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 105^{\circ}C, I_f = 200mA; T_s \geq 103^{\circ}C$ and $T_{air} \geq 100^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3081K	1.000	0.990	0.985	0.978	0.967	0.959	0.953	0.949	0.943	0.938	0.934	0.929	0.925
2	3065K	1.000	0.990	0.982	0.976	0.971	0.962	0.953	0.952	0.947	0.942	0.938	0.931	0.928
3	3086K	1.000	0.992	0.987	0.980	0.971	0.967	0.961	0.956	0.950	0.943	0.938	0.935	0.932
4	3082K	1.000	0.990	0.985	0.977	0.969	0.960	0.953	0.949	0.942	0.936	0.931	0.926	0.920
5	3071K	1.000	0.990	0.986	0.977	0.967	0.963	0.958	0.952	0.947	0.944	0.941	0.937	0.933
6	3097K	1.000	0.994	0.987	0.982	0.974	0.972	0.968	0.965	0.959	0.952	0.949	0.943	0.939
7	3074K	1.000	0.989	0.985	0.978	0.971	0.961	0.953	0.946	0.938	0.932	0.928	0.924	0.920
8	3069K	1.000	0.990	0.984	0.980	0.972	0.964	0.956	0.949	0.943	0.938	0.935	0.929	0.925
9	3078K	1.000	0.991	0.981	0.977	0.959	0.949	0.945	0.940	0.934	0.931	0.927	0.921	0.917
10	3154K	1.000	0.990	0.982	0.975	0.970	0.958	0.957	0.952	0.947	0.944	0.938	0.934	0.928
11	3081K	1.000	0.989	0.985	0.980	0.969	0.965	0.961	0.953	0.949	0.943	0.940	0.936	0.931
12	3081K	1.000	0.991	0.982	0.978	0.967	0.959	0.959	0.952	0.946	0.940	0.937	0.935	0.930
13	3085K	1.000	0.990	0.980	0.973	0.963	0.954	0.951	0.947	0.944	0.937	0.932	0.929	0.923
14	3066K	1.000	0.986	0.979	0.972	0.961	0.956	0.952	0.945	0.939	0.933	0.928	0.924	0.919
15	3099K	1.000	0.991	0.984	0.975	0.968	0.960	0.957	0.950	0.945	0.941	0.936	0.931	0.929
16	3094K	1.000	0.992	0.984	0.974	0.965	0.955	0.953	0.948	0.941	0.935	0.932	0.926	0.923
17	3111K	1.000	0.991	0.985	0.979	0.967	0.964	0.961	0.957	0.952	0.948	0.945	0.941	0.937
18	3088K	1.000	0.989	0.986	0.977	0.967	0.957	0.946	0.944	0.941	0.935	0.931	0.926	0.921
19	3085K	1.000	0.989	0.983	0.976	0.967	0.962	0.955	0.951	0.947	0.942	0.937	0.933	0.929
20	3079K	1.000	0.992	0.983	0.973	0.961	0.957	0.950	0.945	0.941	0.935	0.931	0.928	0.925
21	3066K	1.000	0.985	0.976	0.968	0.962	0.962	0.953	0.949	0.946	0.942	0.938	0.934	0.928
22	3070K	1.000	0.986	0.980	0.971	0.970	0.962	0.953	0.950	0.947	0.943	0.940	0.935	0.932

CIE 1976 u' data for tested units

$T_s = T_{air} = 105^{\circ}C, I_f = 200mA; T_s \geq 103^{\circ}C$ and $T_{air} \geq 100^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3081K	0.2481	0.2476	0.2475	0.2473	0.2471	0.2470	0.2471	0.2469	0.2465	0.2464	0.2466	0.2465	0.2463
2	3065K	0.2486	0.2481	0.2477	0.2476	0.2489	0.2473	0.2464	0.2470	0.2470	0.2469	0.2468	0.2467	0.2465
3	3086K	0.2476	0.2472	0.2468	0.2467	0.2454	0.2463	0.2466	0.2475	0.2460	0.2457	0.2457	0.2456	0.2455
4	3082K	0.2481	0.2477	0.2474	0.2471	0.2473	0.2473	0.2474	0.2475	0.2466	0.2463	0.2463	0.2462	0.2459
5	3071K	0.2482	0.2477	0.2474	0.2471	0.2460	0.2471	0.2474	0.2474	0.2474	0.2471	0.2471	0.2472	0.2470
6	3097K	0.2473	0.2469	0.2465	0.2463	0.2455	0.2463	0.2467	0.2465	0.2452	0.2454	0.2457	0.2457	0.2454
7	3074K	0.2483	0.2478	0.2476	0.2473	0.2469	0.2471	0.2474	0.2474	0.2469	0.2466	0.2467	0.2467	0.2463
8	3069K	0.2485	0.2481	0.2478	0.2476	0.2481	0.2479	0.2474	0.2475	0.2470	0.2468	0.2468	0.2466	0.2463
9	3078K	0.2482	0.2477	0.2474	0.2472	0.2467	0.2466	0.2470	0.2472	0.2463	0.2459	0.2461	0.2459	0.2455
10	3154K	0.2460	0.2454	0.2451	0.2450	0.2460	0.2462	0.2454	0.2459	0.2452	0.2449	0.2451	0.2451	0.2447
11	3081K	0.2480	0.2474	0.2474	0.2467	0.2461	0.2467	0.2474	0.2471	0.2463	0.2460	0.2461	0.2461	0.2457
12	3081K	0.2482	0.2481	0.2475	0.2479	0.2477	0.2485	0.2469	0.2465	0.2469	0.2466	0.2467	0.2465	0.2463
13	3085K	0.2481	0.2480	0.2473	0.2469	0.2453	0.2460	0.2462	0.2469	0.2464	0.2463	0.2463	0.2460	0.2459
14	3066K	0.2487	0.2478	0.2476	0.2475	0.2460	0.2469	0.2456	0.2472	0.2465	0.2461	0.2461	0.2458	0.2456
15	3099K	0.2475	0.2473	0.2472	0.2464	0.2456	0.2456	0.2450	0.2469	0.2460	0.2461	0.2463	0.2463	0.2462
16	3094K	0.2475	0.2470	0.2468	0.2464	0.2457	0.2453	0.2461	0.2468	0.2460	0.2459	0.2462	0.2462	0.2460
17	3111K	0.2471	0.2466	0.2464	0.2459	0.2454	0.2452	0.2460	0.2464	0.2457	0.2454	0.2457	0.2457	0.2456
18	3088K	0.2479	0.2474	0.2472	0.2467	0.2462	0.2459	0.2466	0.2472	0.2471	0.2468	0.2470	0.2468	0.2466
19	3085K	0.2478	0.2474	0.2472	0.2467	0.2468	0.2472	0.2474	0.2486	0.2477	0.2474	0.2476	0.2472	0.2470
20	3079K	0.2483	0.2478	0.2477	0.2472	0.2468	0.2463	0.2462	0.2471	0.2466	0.2466	0.2468	0.2465	0.2464
21	3066K	0.2484	0.2479	0.2477	0.2473	0.2469	0.2469	0.2463	0.2471	0.2466	0.2466	0.2466	0.2463	0.2461
22	3070K	0.2483	0.2478	0.2475	0.2470	0.2461	0.2462	0.2456	0.2468	0.2456	0.2457	0.2459	0.2457	0.2456

CIE 1976 v' data for tested units

$T_s = T_{air} = 105^{\circ}C, I_f = 200mA; T_s \geq 103^{\circ}C$ and $T_{air} \geq 100^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3081K	0.5185	0.5179	0.5177	0.5170	0.5165	0.5165	0.5161	0.5157	0.5158	0.5156	0.5150	0.5147	0.5147
2	3065K	0.5190	0.5183	0.5180	0.5174	0.5178	0.5171	0.5171	0.5165	0.5163	0.5161	0.5153	0.5150	0.5150
3	3086K	0.5196	0.5192	0.5188	0.5182	0.5176	0.5178	0.5180	0.5175	0.5176	0.5168	0.5159	0.5158	0.5158
4	3082K	0.5183	0.5178	0.5175	0.5168	0.5170	0.5173	0.5171	0.5171	0.5168	0.5161	0.5154	0.5150	0.5145
5	3071K	0.5196	0.5192	0.5188	0.5182	0.5174	0.5184	0.5183	0.5180	0.5175	0.5168	0.5161	0.5155	0.5151
6	3097K	0.5192	0.5188	0.5184	0.5178	0.5178	0.5188	0.5165	0.5157	0.5160	0.5164	0.5163	0.5163	0.5159
7	3074K	0.5187	0.5181	0.5180	0.5173	0.5170	0.5171	0.5170	0.5165	0.5168	0.5160	0.5152	0.5155	0.5148
8	3069K	0.5187	0.5183	0.5181	0.5174	0.5182	0.5180	0.5173	0.5167	0.5166	0.5163	0.5155	0.5152	0.5144
9	3078K	0.5186	0.5180	0.5179	0.5172	0.5162	0.5163	0.5165	0.5165	0.5163	0.5159	0.5153	0.5149	0.5143
10	3154K	0.5162	0.5157	0.5155	0.5148	0.5156	0.5168	0.5153	0.5143	0.5141	0.5137	0.5131	0.5134	0.5127
11	3081K	0.5189	0.5181	0.5179	0.5170	0.5160	0.5167	0.5173	0.5167	0.5167	0.5159	0.5153	0.5154	0.5148
12	3081K	0.5182	0.5180	0.5176	0.5180	0.5181	0.5189	0.5186	0.5180	0.5163	0.5157	0.5148	0.5145	0.5144
13	3085K	0.5180	0.5179	0.5173	0.5176	0.5166	0.5156	0.5157	0.5153	0.5154	0.5153	0.5144	0.5140	0.5139
14	3066K	0.5184	0.5185	0.5178	0.5180	0.5179	0.5171	0.5189	0.5163	0.5165	0.5158	0.5149	0.5144	0.5143
15	3099K	0.5181	0.5173	0.5173	0.5178	0.5171	0.5159	0.5155	0.5145	0.5148	0.5152	0.5149	0.5151	0.5149
16	3094K	0.5189	0.5185	0.5180	0.5186	0.5178	0.5166	0.5169	0.5162	0.5158	0.5156	0.5155	0.5156	0.5155
17	3111K	0.5180	0.5176	0.5172	0.5176	0.5174	0.5163	0.5169	0.5160	0.5157	0.5149	0.5148	0.5149	0.5148
18	3088K	0.5183	0.5178	0.5174	0.5178	0.5173	0.5159	0.5161	0.5161	0.5162	0.5155	0.5152	0.5150	0.5148
19	3085K	0.5191	0.5187	0.5183	0.5188	0.5182	0.5171	0.5170	0.5173	0.5169	0.5163	0.5161	0.5157	0.5155
20	3079K	0.5180	0.5176	0.5172	0.5176	0.5169	0.5157	0.5155	0.5147	0.5148	0.5149	0.5146	0.5142	0.5142
21	3066K	0.5196	0.5190	0.5186	0.5192	0.5186	0.5178	0.5170	0.5161	0.5161	0.5164	0.5161	0.5157	0.5155
22	3070K	0.5193	0.5188	0.5183	0.5189	0.5184	0.5165	0.5156	0.5149	0.5155	0.5158	0.5156	0.5154	0.5152

Delta u'v' data for tested units

$T_s = T_{air} = 105^{\circ}C, I_f = 200mA; T_s \geq 103^{\circ}C$ and $T_{air} \geq 100^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3081K	0.0000	0.0008	0.0010	0.0017	0.0022	0.0023	0.0026	0.0030	0.0031	0.0034	0.0038	0.0041	0.0042
2	3065K	0.0000	0.0009	0.0013	0.0019	0.0012	0.0023	0.0029	0.0030	0.0031	0.0034	0.0041	0.0044	0.0045
3	3086K	0.0000	0.0006	0.0011	0.0017	0.0030	0.0022	0.0019	0.0021	0.0026	0.0034	0.0042	0.0043	0.0043
4	3082K	0.0000	0.0006	0.0011	0.0018	0.0015	0.0013	0.0014	0.0013	0.0021	0.0028	0.0034	0.0038	0.0044
5	3071K	0.0000	0.0006	0.0011	0.0018	0.0031	0.0016	0.0015	0.0018	0.0022	0.0030	0.0036	0.0043	0.0047
6	3097K	0.0000	0.0006	0.0011	0.0017	0.0023	0.0011	0.0028	0.0036	0.0038	0.0034	0.0033	0.0033	0.0038
7	3074K	0.0000	0.0008	0.0010	0.0017	0.0022	0.0020	0.0019	0.0024	0.0024	0.0032	0.0038	0.0036	0.0044
8	3069K	0.0000	0.0006	0.0009	0.0016	0.0006	0.0009	0.0018	0.0022	0.0026	0.0029	0.0036	0.0040	0.0048
9	3078K	0.0000	0.0008	0.0011	0.0017	0.0028	0.0028	0.0024	0.0023	0.0030	0.0035	0.0039	0.0044	0.0051
10	3154K	0.0000	0.0008	0.0011	0.0017	0.0006	0.0006	0.0011	0.0019	0.0022	0.0027	0.0032	0.0029	0.0037
11	3081K	0.0000	0.0010	0.0012	0.0023	0.0035	0.0026	0.0017	0.0024	0.0028	0.0036	0.0041	0.0040	0.0047
12	3081K	0.0000	0.0002	0.0009	0.0004	0.0005	0.0008	0.0014	0.0017	0.0023	0.0030	0.0037	0.0041	0.0042
13	3085K	0.0000	0.0001	0.0011	0.0013	0.0031	0.0032	0.0030	0.0030	0.0031	0.0032	0.0040	0.0045	0.0047
14	3066K	0.0000	0.0009	0.0013	0.0013	0.0027	0.0022	0.0031	0.0026	0.0029	0.0037	0.0044	0.0049	0.0051
15	3099K	0.0000	0.0008	0.0009	0.0011	0.0021	0.0029	0.0036	0.0036	0.0036	0.0032	0.0034	0.0032	0.0035
16	3094K	0.0000	0.0006	0.0011	0.0011	0.0021	0.0032	0.0024	0.0028	0.0034	0.0037	0.0036	0.0035	0.0037
17	3111K	0.0000	0.0006	0.0011	0.0013	0.0018	0.0025	0.0016	0.0021	0.0027	0.0035	0.0035	0.0034	0.0035
18	3088K	0.0000	0.0007	0.0011	0.0013	0.0020	0.0031	0.0026	0.0023	0.0022	0.0030	0.0032	0.0035	0.0037
19	3085K	0.0000	0.0006	0.0010	0.0011	0.0013	0.0021	0.0021	0.0020	0.0022	0.0028	0.0030	0.0035	0.0037
20	3079K	0.0000	0.0006	0.0010	0.0012	0.0019	0.0030	0.0033	0.0035	0.0036	0.0035	0.0037	0.0042	0.0042
21	3066K	0.0000	0.0008	0.0012	0.0012	0.0018	0.0023	0.0033	0.0037	0.0039	0.0037	0.0039	0.0044	0.0047
22	3070K	0.0000	0.0007	0.0013	0.0014	0.0024	0.0035	0.0046	0.0046	0.0047	0.0044	0.0044	0.0047	0.0049

Forward Voltage [V] data for tested units

$T_s = T_{air} = 105^{\circ}C, I_f = 200mA; T_s \geq 103^{\circ}C$ and $T_{air} \geq 100^{\circ}C$ in compliance with LM-80-15

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	3081K	26.310	26.280	26.270	26.290	26.290	26.310	26.340	26.540	26.520	26.690	26.410	26.400	26.410
2	3065K	26.170	26.150	26.120	26.160	26.160	26.170	26.180	26.130	26.370	26.480	26.210	26.230	26.240
3	3086K	26.050	26.060	26.010	26.060	26.050	26.050	26.090	26.120	26.260	26.420	26.100	26.130	26.160
4	3082K	26.200	26.190	26.150	26.200	26.180	26.180	26.180	26.430	26.460	26.530	26.350	26.360	26.370
5	3071K	26.240	26.240	26.210	26.250	26.240	26.240	26.240	26.440	26.450	26.550	26.390	26.370	26.380
6	3097K	26.080	26.150	26.060	26.100	26.090	26.100	26.160	26.300	26.310	26.200	26.160	26.130	26.150
7	3074K	26.410	26.380	26.380	26.420	26.420	26.420	26.300	26.420	26.620	26.660	26.500	26.550	26.490
8	3069K	26.290	26.550	26.270	26.320	26.330	26.330	26.300	26.500	26.410	26.350	26.540	26.270	26.220
9	3078K	26.070	26.100	26.050	26.090	26.060	26.100	26.130	26.410	26.320	26.290	26.190	26.200	26.170
10	3154K	26.350	26.470	26.310	26.370	26.370	26.360	26.180	25.680	26.400	26.280	26.250	26.260	26.260
11	3081K	25.990	26.200	26.050	26.230	25.960	25.980	26.010	25.490	26.150	26.180	26.040	26.050	26.040
12	3081K	26.180	26.600	26.180	26.210	26.180	26.190	26.110	25.570	26.360	26.320	26.230	26.260	26.210
13	3085K	26.320	26.370	26.290	26.350	26.300	26.310	26.230	25.660	26.610	26.430	26.370	26.390	26.370
14	3066K	26.260	26.290	26.540	26.290	26.270	26.290	26.300	25.760	26.300	26.280	26.170	26.190	26.170
15	3099K	26.260	26.360	26.270	26.300	26.280	26.300	26.250	25.630	26.470	26.320	26.280	26.310	26.270
16	3094K	26.300	26.340	26.300	26.320	26.320	26.330	26.170	25.610	26.160	26.140	26.070	26.120	26.070
17	3111K	26.200	26.240	26.220	26.220	26.220	26.230	26.280	26.430	26.460	26.450	26.290	26.330	26.290
18	3088K	26.240	26.280	26.250	26.250	26.260	26.260	26.300	26.450	26.460	26.390	26.330	26.340	26.320
19	3085K	25.970	26.010	25.980	26.000	25.950	25.950	25.960	25.450	26.140	26.080	26.020	26.010	26.000
20	3079K	25.910	25.940	25.920	25.920	25.870	25.890	25.900	26.130	26.300	25.990	25.950	25.940	25.940
21	3066K	26.480	26.800	26.720	26.490	26.450	26.450	26.460	26.690	26.700	26.650	26.510	26.500	26.490
22	3070K	26.180	26.200	26.170	26.190	26.160	26.150	26.160	26.370	26.620	26.430	26.390	26.400	26.390

Disclaimer

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Company Information

Lumileds is a leading provider of power LEDs for everyday lighting applications. The company's records for light output, efficacy and thermal management are direct results of the ongoing commitment to advancing solid-state lighting technology and enabling lighting solutions that are more environmentally friendly, help reduce CO2 emissions and reduce the need for power plant expansion. Lumileds LUXEON LEDs are enabling never before possible applications in outdoor lighting, shop lighting, home lighting, digital imaging, display and automotive lighting.

Lumileds is a fully integrated supplier, producing core LED material in all three base colors, (red, green, blue) and white. Lumileds has R & D centers in San Jose, California and in the Netherlands, and production capabilities in San Jose, Singapore and Penang, Malaysia. Founded in 1999, Lumileds is the high flux LED technology leader and is dedicated to bridging the gap between solid-state technology and the lighting world. More information about the company's LUXEON LED products and solid-state lighting technologies can be found at www.lumileds.com.

Appendix: Additional Projected Extrapolations per IESNA TM-21-11

Projected L_{75} extrapolations per IESNA TM-21-11

If = 200mA	
Ts = 105°C	54,798
Ts = 85°C	73,519
Ts = 55°C	99,499

Projected L_{80} extrapolations per IESNA TM-21-11

If = 200mA	
Ts = 105°C	41,735
Ts = 85°C	56,063
Ts = 55°C	75,916

Projected L_{85} extrapolations per IESNA TM-21-11

If = 200mA	
Ts = 105°C	29,464
Ts = 85°C	39,665
Ts = 55°C	53,763

Projected L_{90} extrapolations per IESNA TM-21-11

If = 200mA	
Ts = 105°C	17,894
Ts = 85°C	24,205
Ts = 55°C	32,877

Projected L_{95} extrapolations per IESNA TM-21-11

If = 200mA	
Ts = 105°C	6,993
Ts = 85°C	9,436
Ts = 55°C	13,121

Projected L_{100} extrapolations per IESNA TM-21-11

$I_f = 200\text{mA}$

$T_s = 105^\circ\text{C}$	0
$T_s = 85^\circ\text{C}$	0
$T_s = 55^\circ\text{C}$	0